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ABSTRACT

Twenty-eight outstanding elementary/middle school teachers of science were selected to participate in an honors program being conducted over a three-year period (1985-87) on the campus of Illinois State University. The project, based on the belief that the teacher is the key to addressing the present crisis in science education, was funded by the National Science Foundation. The undertaking includes strands of computer application, teaching methodology, instructional materials developed, involvement of industrial scientists, and leadership development in science. The program primarily provided for the teachers: (1) a renewal and updating in the latest scientific breakthroughs; (2) involvement in an analysis of science education; and (3) leadership opportunities in conducting in-service teacher workshops in science throughout the state. The workshops were devoted to the preparation of written materials for computer, demonstration, laboratory, and instructional use and were designed by the participants to aid other teachers in improving their science courses. The results were disseminated throughout the school districts of Illinois and beyond.
(Author/ML)

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"A RESEARCH PERSPECTIVE:
HONORS PROJECT FOR OUTSTANDING
TEACHERS OF SCIENCE
IN ILLINOIS"

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PRESENTED BY
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March 1986

Abstract:

Twenty-eight OUTSTANDING elementary/middle school teachers of science were selected to participate in an honors program being conducted over a three-year period (1985-1987) on the campus of Illinois State University. The project, based on the belief that the Teacher is the Key to addressing the present crisis in science education, was funded by the National Science Foundation. The undertaking includes strands of computer application, teaching methodology, instructional materials development, involvement of industrial scientists, and leadership development in science. An aggressive search, applying rigorous criteria, assured the selection of the very best science teachers in the State of Illinois. Having been honored for excellence in science teaching, the participants are: 1) being provided with renewal and updating in the latest scientific breakthroughs, 2) involved in analyzing science education, and 3) conducting in-service teacher workshops in science throughout the state. The workshops are devoted to the preparation of written materials for computer, demonstration, laboratory, and instructional use and are designed by the participants to aid other teachers in improving their science courses. The results are disseminated throughout the school districts of Illinois and beyond. This project is developing a strong network of leadership within the State of Illinois.

Rationale:

"The Teacher is the Key"

What science education will be for any one child for any one year is most dependent on what that child's teacher believes, knows, and does--and doesn't believe, doesn't know, and doesn't do. For essentially all the science learned in school, the teacher is the enabler, the inspiration, and the constraint. (NSF Report Number 083-003763, Stake, R. and J. Easley, University of Illinois)

Project Description:

The "Outstanding Science Teachers" Honors Project at Illinois State University was funded by the National Science Foundation. The \$517,118 grant was procured through a proposal written by Dr. Thomas Fitch, Professor of Science Education. The project encompasses a time frame of three years (1985-1987).

The goal of this project is to find better ways to motivate girls and boys to become more actively involved in their science education, to learn how to think, to acquire good scientific skills, and to generate a lasting interest in science. The key to achieving this end is through the teacher; one that is informed, motivated, interesting and challenging. THE TEACHER IS THE KEY!

Finding these special teachers was the first major step. Fifteen thousand brochures were disseminated to school districts throughout the State of Illinois. These brochures explained the Honors Science Teacher Project, the objectives, and the criteria used for selecting the exceptional teachers. Officers of all the appropriate professional organizations and science faculty at the various colleges state-wide received information concerning this search. A six-member selection committee, through rigorous screening procedures, determined the 28 "Outstanding Teachers" from 280 applicants. Fourteen were elementary teachers and fourteen were junior high/middle school teachers.

Having been selected, the participants were honored at a banquet, given a commemorative plaque, and received recognition by the media. They were also recognized at a special ceremony at the 18th Annual Illinois Science Teachers Association Convention on October 5, 1985, at Normal, Illinois. This was an important aspect of the project for many reasons: 1) It gave the participants the well earned attention for their exemplary teaching, which in itself, creates confidence and self-esteem;

2) It gave the participants credibility so that they would be more readily accepted as in-service presenters with recognized skills and invaluable teaching materials to share; and, 3) It gave the participants visibility---four of the teachers went on to earn other awards: Carol Van De Walle has been named the "1986 National Exemplary Elementary Science Teacher of the Year" by the CEAI; Chris Linas won the Teacher Achievement Award from the 5th Congressional District (1985); William Conrad was selected for the National Ohaus Award for innovation in science teaching (1985); and, Joseph Sidwell has been named "Man of the Year" by the Mt. Zion Lion's Club (1986).

It cannot be emphasized enough that the teachers selected for this project are a resource, not an empty vessel to be filled with scientific facts and formulae. The success of this project will not be measured by the number of hours spent in a science class nor by how many graduate hours of credit are generated nor advanced degrees awarded. Instead, the success of this project can be judged on the attainment of the objectives: 1) honoring distinguished teaching in science; 2) providing intellectual renewal; 3) production of tangible products such as: science-related microcomputer programs, written science instructional units, modules, laboratory investigations for pupils, written proposals to support science instruction, written science journal articles, in-service teacher workshops conducted, scientific presentations at professional conferences, written/revised curricula, written recommendations for improvement in science education; 4) a research-gathering network of leadership in science in the state; and, 5) a cadre of articulate spokespersons for the advancement of science education for Illinois and the nation.

To attain the objectives of the project, the honored teachers first assemble in April of each year on the campus of Illinois State

University. Here, they inventory themselves; determining their individual strengths, weaknesses, interests and goals. They then choose an area (or areas) in which they wish to grow or expand. The identified areas are translated into the objectives participants will pursue during the intensive summer institute in July.

The participants reside for one month on the campus of Illinois State University in Normal, Illinois. At this time, they are paid one full month of their regular salary, (paid by the grant). Throughout the month of July the participants are working individually and as a group to further the advancement of science education. Developing tangible instructional products is of utmost importance and is highly stressed. Producing written science instructional materials for children and teachers is one sure way to generate a multiplier effect which will reach out and affect a much wider constituency. Dissemination of these products occurs through participants conducting workshops and other in-service activities for teachers in their school districts.

The morning sessions of the summer institute are scheduled for academic renewal through laboratory experiences, short courses, seminars, and workshops. The afternoon sessions are individualized. Each participant is assigned to a faculty mentor. Each participant negotiates an individual contract with his/her mentor. Each participant sets goals and objectives for developing the instructional materials with his/her mentor within the context of the project objectives. The individual contracts are flexible. They can be revised and changed as the need arises. Participants who share common objectives are encouraged to engage in small-group work sessions. Specialized workshops are created upon demand. Laboratory, media, and library resources are open. Word processing microcomputers are available. Laboratory assistants, project faculty, and participants work together

on common projects of mutual interest in small writing teams.

A wide array of projects was evidenced at the 1985 summer institute: microcomputer interfacing, archeology, outdoor curriculum, problem solving activities, earth science, DNA, drugs, nutrition, physiology, acid rain, gifted life science, oceanography, snow flakes, consumer affairs, special education, energy, and much more. Time for sharing project results was also allotted. The work on these projects did not necessarily end with the last meeting at the summer institute. Many participants continued to develop their projects throughout the school year.

Due to the hard work and dedication of the participants, the mentors, and the project facilitators, many of the project objectives have been met or are well on their way to being met. The tangible results are as follows:

- eleven proposals have been written: six proposals have been funded; five have been submitted and are awaiting a reply
- three journal articles have been published; nine journal articles have been submitted; and four are in the process of being written
- 171 teacher in-service workshops have been presented at the school, district, and regional levels (in an 8 month period)
- a state-wide Science Olympiad has been organized by a participant
- one participant is writing a science book
- two brochures are being written related to science education
- seventeen science fairs have been held (in an 8 month period)
- a significant amount of curriculum has been written

including, but not limited to: 1) writing the gifted science curriculum for a magnet school; 2) revising the entire science curriculum for grades 1-8; 3) developing a complete science course to be taught at a high school; 4) developing the science curriculum for special education; 5) modifying a textbook approach curriculum to a "hands-on" approach; and 6) developing and disseminating units on science methods, outdoor curriculum, computers, energy, acid deposition, student research, and others.

The NSF Honors Project has made a significant difference in the participants' professional lives. When surveyed, their comments included:

---I was seriously considering leaving the teaching profession, now I feel like what I'm doing is important!

---I'm having an impact on other teachers. . .they're getting out of the textbooks and into student-centered activities

---My administration is more responsive and supportive verbally and physically (\$\$\$\$).

---It's opened up communication channels. I now have contacts all over the state that have expertise in a variety of areas.

---The material I collected last summer from these "super" teachers is being used by a lot of the elementary teachers in my area.

---My co-workers had lost their spirit. . .the energy I brought back from the other participants has had an impact on myself, my co-workers, and my students.

---It keeps me current in science.

---It has expanded my horizons. . .I would never have

considered writing a grant proposal before!!

---The state-wide materials exchange has been invaluable to me and my students.

---It's allowed me to grow. . .I was getting stagnant.

---My requests for budget increases were approved this year!

When surveyed about what they felt was the most important aspect of the project, some of the participants replied:

---We have created a corps of dedicated people that will have more impact as a group than a single individual

---It gives the participants credibility so information is more readily disseminated.

---We are strengthening science programs in our schools and districts. . .thanks to suggested options provided.

---This "seed" will develop and multiply and multiply.

---The reason this project is successful is because it is more than one year. . .it has continuity and we have an obligation to fulfill certain expectations.

---Our participants have had an influence on the rebirth of the "hands-on" process--which is much more exciting for students in science classes.

---We have caring, dedicated people that will continue to have an affect after the project is over.

---Science is getting visibility in Illinois!!

Project evaluation is multi-faceted. Evaluation includes both formative and summative techniques. The formative information gathering includes written reactions, concerns, comments, and suggestions elicited on a weekly basis during the summer institutes. These come from both the honored teachers and the project staff. A written weekly log is maintained describing each project event. The

purpose of the formative evaluation is to maintain high sensitivity to the needs of the participants and assuring those needs are met. This type of evaluation keeps a finger on the pulse beat of the project on a day-to-day basis. There must be adaptiveness, flexibility, and responsiveness. Maintaining high morale and positive attitudes needs to be in balance with maintaining academic rigor and high productivity of material development.

Longitudinal data, gathered over a three-year period, will be used to document trends and problems in science education. The summative evaluation will be published in appropriate professional journals.

Data generated from this project will provide a state-wide perspective essential for planning future decision making in science education. A number of recommendations will be written, printed and distributed by the people involved in the project.

For further information kindly contact:
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HONORS PROJECT PROGRESS CHART

PROJECT OBJECTIVES

---Identify 28 Outstanding teachers of science in the State of Illinois (14 elementary, 14 junior high/middle school teachers)

---Honor the selected teachers with an appropriate recognition plaque, media releases, professional recognition, banquet, and recognition from state government officials

---Provide opportunities for academic renewal through laboratory experiences, short courses, seminars, workshops, contact with academic researchers and industrial scientists at the "cutting edge" of scientific advancements, field trips, and individual "one-on-one" contact with other outstanding teachers. Graduate academic credit will be available and may be elected.

PROJECT EVALUATION

Selection completed in February 1985

Conducted October 1985

Continuing process

Continuing media releases

Continuing professional recognition

Partially completed as of 3/86. Will continue through 1986-1987. Concentrated Intensive On-Campus Studies occur in July of each year.

July 1-31, 1985

July 1-31, 1986

July 1-31, 1987

OBJECTIVES

EVALUATION

---Develop tangible instructional products (including but not limited to):

A) Microcomputer science instructional programs.

B) Written science instructional unit/modules for pupils.

C) Written proposals for funding which may include instructional materials support, in-service training, professional conferences, and/or instructional equipment support.

D) Written science journal articles.

E) Written plans for science fairs and/or exhibits.

Many workshops conducted in this area -
Continuing process

On going - continuous

11 proposals prepared in 8 month period:
6 proposals have been funded
5 have been written, submitted and
await a reply

3 articles have been published
9 have been submitted
4 are in the process of being written

17 science fairs for children have been
held by the participants of the project.
Project participant currently chairperson
for "Science Olympiad".

OBJECTIVES

F) Written in-service teachers workshop plans.

G) Presentations at state-wide professional conferences.

H) Written revised science curriculum for their classroom, school and/or school district.

EVALUATION

171 teacher in-service workshops have been presented by the participants at the school, district and regional levels.

NSTA - Regional and National Conventions
ISTA - State-wide science convention
(Every honored teacher has given one or more presentations.)

20 participants have made major contributions to revising and creating science curriculum including, but not limited to:

- Writing the gifted science curriculum for a magnet school
- Revising the entire science curriculum for grades 1-8
- Developing a complete course
- Developing the science curriculum for special education
- Modifying textbook approach curriculum to "hands-on" approach
- Developing and disseminating units of science methods, outdoor curriculum, computers, energy, acid deposition, student independent research, and others

OBJECTIVES

1) Written ideas/recommendations for improvement of science education at the local/state level

---Develop a network of leadership in science for the State of Illinois

---Develop increased competency in microcomputer application in science instruction

---Develop increased diversity in science teaching methodology (with high emphasis upon "hands-on" laboratory investigation)

---Come in contact with academic researchers and industrial scientists

---Provide renewal and updating for top-quality teachers in science

---Analyze pre-college science education from the perspective of the best classroom teachers as a planning aid for science at the local school districts, the state, and the nation

EVALUATION

In process - continuous

Ongoing --

A monthly mailing and newsletter is sent.
Phone calls bi-monthly

Partially completed 7/85. Will continue through 1986-1987.

Continues to change as events change

A quality of recognized excellence in the individual - the project nurtures this bias.

Ongoing

Continuous

Ongoing process

OBJECTIVES

---Gather longitudinal data, over a three-year period, which documents trends and problems in science education

---To significantly improve the quality of science education for elementary/junior high/middle school students in the State of Illinois

EVALUATION

Base line data gathered --
Data periodically collected for comparative purposes

On going